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Rc.A5/Ph.D/1181/2007 Dt: 25.09.2007

Dr. R. DHANDAPANI
REGISTRAR

Confidential

To
Dr.Aminudin Zuhairi
Head, Quality Assurance Centre
Universitas Terbuka,
Jalan Cabe Raya,
Pumulang, Tangerang- 15417,
Indonesia.

Dear Professor,

Sub: Department of Education – Ph.D. thesis sent for valuation- reg.
Ref: Your acceptance letter addressed to Dr.P.Sivakumar, dated 25.07.07

By direction, I am sending herewith the Ph.D. thesis entitled "DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD BASED LEARNING COURSEWARE FOR LEARNING PHYSICS AT HIGHER SECONDARY LEVEL" .

You are requested:

i) to evaluate the thesis *WITH IN SIXTY DAYS FROM THE DATE OF RECEIPT OF THIS THESIS*

ii) to give **duly signed detailed report** in *two copies*, which may contain your specific remarks on the thesis including merits and demerits of the study.

iii) to give your specific comments on the grading commendation in the enclosed prescribed format, in ***two copies.***.

Your reports may be dispatched to the following address in a confidential cover.

Address: **"Dr.R.Dhandapani, Registrar, Alagappa University, Karaikudi – 630 003, India."**

Please keep this appointment strictly **"Confidential".**

Your kind cooperation is solicited for early publication of results, on the lines suggested above.

Kindly acknowledge the receipt of this thesis.

Yours sincerely

REGISTRAR

NOTE: KINDLY RETAIN THE ABOVE Ph.D THESIS AT YOUR END.

Encl:

1. Thesis - 1 no.
2. Evaluation Report - 2 nos.
3. Acquittance slip
4. Evaluation rules
5. Acknowledgement letter

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KARAIKUDI.

PROFORMA FOR ADJUDICATION OF THE PH.D.THESIS

1. Name of the candidate : A. EDWARD WILLIAM BENJAMIN
2. Title of the thesis : Development of Interactive Multimedia CD Based Learning Courseware for Learning Physics at Higher Secondary Level.
3. Discipline and subject : Education
4. Name and address of Examiner : Dr. Aminudin Zuhairi Universitas Terbuka, Indonesia
5. Recommendation of the Examiner (Please strike out whichever are not applicable) :

~~a) Thesis is "Highly Commended"~~

(or)

b) Thesis is " Commended" Aminudin Zuhairi

(or)

~~c) Thesis is commended and Degree may be awarded subject to the condition of furnishing satisfactory clarification to the queries during the public viva-voce examination~~

(or)

~~d) Thesis is commended and Degree may be awarded with the condition that the corrections / modifications suggested are carried out in the thesis and duly certified by the Research Supervisor - Convener before the public viva-voce examination~~

(or)

~~e) Thesis is not commended for the award of the Degree.~~
~~(If the thesis is not recommended for the award enough justification is to be given)~~

Note : Please enclose your detailed report on the thesis. A list of questions, if any, to be asked at the puplic viva - voce examination, may also be sent.

Please make sure that you have indicated any one of the options given in a), b) c), d), e) before affixing your signature below and enclosed detailed report on the thesis.

6. Any other remarks :

I have read this thesis with pleasure, and it has addressed important issues in the topic being investigated.

Place : Jakarta, Indonesia

Date : 21/01/08

Aminudin Zuhairi

AMINUDIN ZUHAIRI

(Signature of the Examiner with Designation)

ALAGAPPA UNIVERSITY

(Accredited with 'A' Grade by NAAC)

KARAIKUDI.

PROFORMA FOR ADJUDICATION OF THE PH.D.THESIS

1. Name of the candidate : A. EDWARD WILLIAM BENJAMIN
2. Title of the thesis : Development of Interactive Multimedia CD Based Learning Courseware for Learning Physics at Higher Secondary Level.
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   Universitas Terbuka, Indonesia
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(or)

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(or)

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Please make sure that you have indicated any one of the options given in a), b) c), d), e) before affixing your signature below and enclosed detailed report on the thesis.

6. Any other remarks :
   I have read this thesis with pleasure, and it has addressed important issues in the topic being investigated.

Place : Jakarta, Indonesia

Date : 21/01/08

Aminudin Zuhairi

AMINUDIN ZUHAIRI

(Signature of the Examiner with Designation)

DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD BASED LEARNING COURSEWARE FOR LEARNING PHYSICS AT HIGHER SECONDARY LEVEL

THESIS SUBMITTED TO ALAGAPPA UNIVERSITY
IN PARTIAL FULFILMENT FOR THE AWARD OF
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN EDUCATION

BY

A. EDWARD WILLIAM BENJAMIN

RESEARCH SUPERVISOR

Dr. P.SIVAKUMAR

College of Education
ALAGAPPA UNIVERSITY
Accredited With 'A' Grade by NAAC
Karaikudi-630 003
India

June-2007

DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD BASED LEARNING COURSEWARE FOR LEARNING PHYSICS AT HIGHER SECONDARY LEVEL

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Karaikudi-630 003
India

June-2007

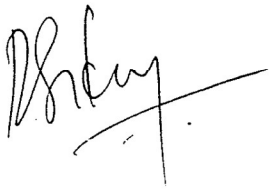
Dr.P.SIVAKUMAR
Deputy Director, Centre for Adult, Continuing Education and Extension,
Alagappa University,
Reader in Education,
Alagappa University College of Education,
Karaikudi – 630 003.

CERTIFICATE

This is to certify that the thesis *entitled* ***"DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD BASED LEARNING COURSEWARE FOR LEARNING PHYSICS AT HIGHER SECONDARY LEVEL"*** submitted by **A.EDWARD WILLIAM BENJAMIN** for the award of Doctor of Philosophy is a record of research work done under my guidance and supervision during the period of 2005-2007 and the dissertation has not formed the basis for the award to the Scholar of any Degree, Diploma, Associateship, Fellowship or any other similar title.

Also certified that the dissertation represents an independent work on the part of the candidate.

(DR.P.SIVAKUMAR)



Karaikudi

Date : 20-06-07

RESEARCH SUPERVISOR

A. EDWARD WILLIAM BENJAMIN
Ph.D Scholar (Part-time)
College of Education
Alagappa University
Karaikudi – 630 003

DECLARATION

I hereby declare that the thesis entitled ***"DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD BASED LEARNING COURSEWARE FOR LEARNING PHYSICS AT HIGHER SECONDARY LEVEL"*** submitted to **ALAGAPPA UNIVERSITY** for the award of the degree of Doctor of Philosophy in Education is my original work and that it has not previously formed the basis of the award of any degree, Diploma, Associateship, Fellowship or any other similar title of the University or Institution.

A. EDWARD WILLIAM BENJAMIN

ACKNOWLEDGEMENT

"All knowledge and wisdom comes from God the father, who is seated above all the heavens".

At the outset, I thank God, the father for giving me the wisdom to carry out this experiment.

First of all, I would like to express my sincere sense of gratitude to my guide Dr. P.Sivakumar, Deputy Director, Centre for Adult, Continuing Education and Extension, Alagappa University and Reader in Education, Alagappa University College of Education, Karaikudi, for his valuable guidance and support in helping me to complete my research work successfully.

I express my heartfelt and profound feelings of gratitude to my Principal, Rev.Fr.Dr.J.Paul, Principal, Pope John Paul-II College of Education for permitting me to do this doctoral thesis. I am also thankful for his constant encouragement and the permission to conduct the experiment in Blessed Mother Teresa Model Higher Secondary School, Pondicherry.

I am much grateful to Dr.S.Prema, Professor and Head of the Department of Education, Alagappa University, Karaikudi, Dr.C.R.Vasantha, Principal, Alagappa University College of Education, Karaikudi and all the staff members of College of Education and Department of Education for their invaluable & constant encouragement to all the Ph.D Scholars.

My thanks also go out to my colleagues Dr.R.Manoharan, Dr.S.Ganapathy , Dr.S.Arulsamy and all the staff of Pope John Paul II College of Education, Pondicherry.

Also I thank the Rev. Sisters of Holy Cross College and Mrs. Cheryl Ann, Lecturer, Pope John Paul II College of Education, Pondicherry for the literature and proof reading of my thesis work.

I would like to thank Mr.P.Aruldass, Mr. Poovazhagan and Mr. Paulraj for their successful technical work and other favourable help during the development of the CD courseware.

My gratitude to the librarians for permitting to take all the references from Pope John Paul II College of Education, Pondicherry, Annamalai University, Chidambaram, Alagappa University, Karaikudi, Madras University, Chennai, Education Technology Department, Bharathidhasan University, Trichy.

I place on record my gratitude to all my family members and my sisters for their constant patience and encouragement throughout my studies.

Dedicated to the Almighty

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Registrar
Alagappa University – India

Evaluation of Ph.D. Thesis submitted to College of Education Alagappa Univesity, India

"DEVELOPMENT OF INTERACTIVE MULTIMEDIA CD BASED LEARNING COURSEWARE FOR LEARNING PHYSICS AT HIGHER SECONDARY LEVEL" by A. Edward William Benjamin (Research Supervisor: Dr. P. Sivakumar), June 2007

I have read with great pleasure the thesis entitled "Development of Interactive Multimedia CD Based Learning Courseware for Learning Physics at Higher Secondary Level" by A. Edward William Benjamin with great pleasure. The author has addressed an important issue in the educational field which has significant values to improved understanding of the theories and best practices in education, particularly the development of interactive multimedia courseware for learning physics at schools.

The teaching of science, particularly physics as the author's investigation has been focused, is an area which has continually received attention and emphasis from stakeholders. The author is concerned with ways and methods of responding to challenges of knowledge explosion through the use of information and communication technology. This is a fundamental challenge to address in educational field. More comments and suggestions are presented as the followings.

Chapter I Introduction has addressed the fundamental issues in media, technology, the teaching of science, the teaching of physics, and the use of ICT, multimedia and interactive multimedia in the teaching of physics. The need, significance and scope of the study have been described adequately in this chapter.

However, Chapter I lacks of a clear statement on the fundamental research question(s) to be addressed in the research. Furthermore, the author also needs to state the objectives or aims of the study. These two issues are important to make sure that the author himself focuses his research endeavour to address the research questions and put himself on the track guided by the clearly stated problem and aims of the research.

Chapter II Conceptual Framework presents the framework and arguments on multimedia and interactive multimedia and their uses in education, electronic resources in education, and design aspects in the use of multimedia and interactive multimedia.

However, it is important for the author to note aspects that relate to sequential presentation of the conceptual framework. The whole thesis discusses interactive multimedia CD based learning courseware for learning physics at school. The conceptual framework should thus be presented beginning with discussion about interactive multimedia: what is it, why is it used, how is it developed, how is it used in learning physics at school? It is also important to address

the design and development of interactive multimedia. Then, discussions on issues relating interactive multimedia, such as type, uses, resources, and so forth can follow.

Chapter III reviews related literature and relevant research in multimedia and interactive multimedia in education, particularly the teaching of physics. The author has conducted extensive reviews, which include both literature and research in India as well as in the rest of the world outside India. This should give him with solid theoretical base in formulating his research questions, determining rationale for the study, and in conducting the study. This Chapter is well written by the author. It systematically discusses the relevant issues, critically analyses them, and thus enriches knowledge in the subject being investigated.

One important point which is not clearly dealt with in this chapter is how the author concretely relates the reviews of literature and research to the present study. Many of the literature reviews have focused on the benefits of using interactive multimedia, and a lot of evidence has been presented through research. The author needs to address in more details reviews of literature and research which specifically focus on the design and development of interactive multimedia. This should then be linked with the major hypothesis in Chapter IV, which states "The Interactive Multimedia CD Based Learning Courseware is an effective method of learning physics at higher secondary level" (p. 122). This chapter should thus address the questions such as: "What sort of interactive multimedia? How is it designed? How effective is it? What criteria of effectiveness in learning using interactive multimedia?"

Chapter IV elaborates the research methods, development of instruments, and administration of tests used to collect data. Chapter IV is well presented, elaborating the research methods, instruments, data collection techniques in detail. Elaboration of experiment and its prerequisites are nicely presented. The research design also depends on the conceptual framework and the review of literature and relevant research.

Chapter V presents analysis and interpretation of data, which includes methods of descriptive and differential analyses, results of hypothesis testing and discussion of findings. The author has used a variety of methods for data analysis, and discusses the findings in order to come to valid conclusions. Findings are clearly presented.

Chapter VI gives summary and conclusions, which sum up the whole research and provide the conclusions based on analysed data collected during the study. Good summary are presented and valid final conclusions are achieved using analyses data and findings in this study.

Having the whole thesis enthusiastically, I come to the final conclusion that overall this is a valuable thesis which contributes to improving our understanding of the use of interactive multimedia courseware for learning physics at secondary schools. The thesis has addressed important questions in the field, inspired readers to have better understanding of the field,

enriched knowledge in the field. It is original in nature so that it helps construct new knowledge in the use of interactive multimedia in the teaching of physics at school.

I wish to congratulate the author for this great work and important endeavour. The thesis is invaluable and of great interest for a person like myself and my colleagues at Universitas Terbuka (Open University) in Indonesia. I would like to keep the thesis at my institution and donate to our University library so that professionals working in the field in my institution can refer to it for future research and development of the field.

It has been a great pleasure to read the thesis. I recommend that the thesis is commended, and further actions by the University can follow.

Jakarta, Indonesia

20 February 2008

Aminudin Zuhairi, Ph.D.

Univesitas Terbuka